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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/662,667	NAKAJIMA, TAKEHIRO	
	Examiner	Art Unit	
	Peter L. Cheng	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8,10,21-26,29,31,37* is/are rejected.

7)☒ Claim(s) *6,7,9,11-20,27,28,30 and 32-36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/15/2003, 9/9/2005, 3/17/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

- There are some typographical and grammatical errors in the disclosure; for example, **page 5, line 25** ("an modification"), **page 8, lines 17 – 18** ("using printing command"), **page 11, line 7** ("combined to the" should be "combined with the"),

- The following are only suggestions; for example, **page 1, lines 19, 23** (suggest usage of the word **intersection** in place of **peak**), **page 2, lines 4 – 5** (suggest rephrasing "As a result, the operation of creating the printer profile produces quite an overload" to "As a result, creating the printer profile is very time-consuming", or similar wording), **page 6, line 25 – page 7, line 2** (suggest rephrasing "The history storage unit 11 stores measured values (L, a, b) 201 in Lab coordinate of the past color patches and vector values 203 obtained ..." to "The history storage unit 11 stores previously measured color patch values (L, a, b) 201 in Lab coordinates and vector values 203 which are obtained ...", or similar wording), **page 9, lines 20 – 22** (similarly, suggest rephrasing "The history storage unit 11 stores measured values (L, a, b) 201 in Lab coordinate of the color patches of the past as shown in Fig. 2A" to "The

history storage unit 11 stores previously measured color patch values (L, a, b) 201 in Lab coordinates as shown in Fig. 2A", or similar wording**), page 9, lines 22 – 23 (**suggest rephrasing "The measured values 201 of the past color patches" to "The previously measured color patch values 201", or similar wording**), page 14, lines 2 - 3 (**suggest replacing "values measured last time and this time" with "last-measured value and the newly measured value"**), page 14, line 5 (**suggest replacing "large amount of samples" with "large number of samples"**), page 14, line 5 (**suggest replacing "value measured this time" with "newly measured value"**), page 14, lines 6 – 9 (**suggest replacing "the result of measurement the time before last is loaded from the history storage unit 11 to calculate a difference ("B1") between the result the time before last and the newly measured result" with "the patch measurement made just prior to the last measurement is loaded from the history storage unit 11 to calculate a difference ("B1") between the result from the measurement made just prior to the last measurement and the newly measured result", or similar wording**), page 14, line 20 (**suggest replacing "for the last time and this time" with "for the last and current measurements"**), page 14, line 21 (**suggest replacing "last time" with "during the last measurement"**), page 14, line 22 (**suggest replacing "this time" with "for the current measurement"**), page 14, line 23 (**suggest replacing "the condition for this time" with "the current condition"**), page 15, line 8 (**suggest replacing "to measure again the patches" with "and the patches are measured again", or

similar wording), **page 15, lines 14 – 16 (**suggest replacing "When the arrangement of the color patches ... cannot be followed" with "When the selection and arrangement of the color patches is predetermined as in conventional technology, a change in a color which does not correspond to one of the predetermined patches cannot be followed", or similar wording), **page 17, line 22 (**suggest replacing "which makes it possible to adapt to the change of the printer with time" with "which makes it possible to adapt to changes in the printer over time", or similar wording**);**

- **Page 6, line 20:** for clarity, since **LUT 202** is depicted in **Fig. 2,** reference to **Fig. 2** should be made; similarly, for **(L, a, b) 201 [page 6, line 25]**, and **vector values 203 [page 7, line 1]**;

- **Page 7, lines 17 - 19:** as written, applicant appears to be citing a "program for generating a C language program" as in a "compiler"; if this is correct, no changes need to be made; otherwise, rephrasing this sentence would clarify applicant's intention; similarly, for **page 7, lines 22 –25,** it is not clear which program (that is, **the program for generating**, or **the C language program**) can be downloaded through the network;

- **Page 10, line 7:** for clarity, since the number **B** is not mentioned elsewhere, **the number B of representative vectors ...** may be clearer if phrased **the number of representative vectors ...**;

- **Page 13, line 8:** it is assumed that applicant intended to cite **based on any of the third LUTs 217a to 217m** instead of **based on the second LUT 215**;

- **Page 13, lines 9 – 10:** for clarity, it is suggested that the phrase, **If no instruction is received from the user (step S4, No)** be changed to, **If the user does not measure only a representative color (step S4, No)**, or similar wording; similarly, for **page 13, lines 11 – 12,** it is suggested that the phrase **for the whole pieces of data** be changed to **for the entire data**, or similar wording;

- **Page 14, lines 5 - 6:** it is assumed that applicant intended to cite **If A1 is greater or equal to A2 (step S5, No)** instead of **If A1 is greater than A2 (step S5, No)** since this is implied by the "No" branch in **Fig. 4, step S5** (that is, "not A1 < A2" is "A1 >= A2"); otherwise, the corresponding **step S5** in **Fig. 4** should be updated;

- **Page 15, line 6:** it is assumed that applicant intended to cite **LUT 202** instead of **LUT 201** since the look-up table is numbered **202** in **Fig. 2A;**

Appropriate correction is required.

2. The use of the trademarks **Windows®**,**U NIX®**, and **Linux®** **[page 7, line 10; page 9, line 4]** has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Objections

3. Claim 1 is objected to because of the following informalities:

- **Page 19, line 9:** it is assumed that applicant intended to cite ***current*** **information on the measurement of the color chart** instead of **information on the measurement of the color chart** in order to differentiate it from ***history*** **information on the measurement of the color chart** (which is cited on **lines 6 – 7, 8)**;

4. Claim 2 is objected to because of the following informalities:

- If applicant intended to cite ***current information*** **[claim 1, page 19, line 9]**, it is not clear whether **the information on the measurement of the color chart [claim 2, page 19, line 15]** refers to the ***history information*** or ***current information***; it is assumed that ***the information*** may refer to either ***history information*** or ***current information***;

5. Claim 21 is objected to because of the following informalities:

- **Page 24, line 24:** it is assumed that applicant intended to cite ***current*** **information on the measurement of the color chart** instead of **information on the measurement of the color chart** in order to differentiate it from ***history*** **information on the measurement of the color chart** (which is cited on **lines 21 – 22, 23**);

6. Claim 23 is objected to because of the following informalities:

- **Page 25, line 21:** it is assumed that applicant intended to cite ***current*** **information on the measurement of the color chart** instead of **information on the measurement of the color chart** in order to differentiate it from ***history*** **information on the measurement of the color chart** (which is cited on **lines 18 – 19, 20**);

7. Claim 24 is objected to because of the following informalities:

- **Page 26, lines 8 - 9:** it is assumed that applicant intended to cite ***current* information on the measurement of the color chart** instead of **information on the measurement of the color chart** in order to differentiate it from ***history* information on the measurement of the color chart** (which is cited on **lines 6 - 7, 8)**;

8. Claim 37 is objected to because of the following informalities:

- **Page 30, lines 16 - 17:** it is assumed that applicant intended to cite ***current* information on the measurement of the color chart** instead of **information on the measurement of the color chart** in order to differentiate it from ***history* information on the measurement of the color chart** (which is cited on **lines 14 - 15, 16)**;

Appropriate correction is required.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claim 37 is rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. It is not clear how the ***computer program that makes a computer to execute*** is accessible by a computer. That is, a structural and functional interrelationship between the computer program and the structural elements of the computer, which would permit its functionality to be realized, should be included in the claim. Therefore, it is suggested that the words ***residing on computer-readable recording medium*** be inserted after **program** (that is, **A computer program *residing on computer-readable recording medium* that makes a computer to execute ...**).

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1, 2, 4, 5, 8, 10, 23, 24, 25, 26, 29, 31, 37 rejected under 35 U.S.C. 102(e) as being anticipated by **KUMADA [US Patent Application 2002/0145744 A1]**.

As for claim 1, KUMADA teaches an image processing apparatus comprising:

a converting unit that performs color conversion of input data ["A colorimeter (spectrophotometer) 1001 and colorimetric module 1002 measure color patches of a sample image ... printed by an output device. The colorimetric result is supplied to a profile generation module 1003 *on-line* or off-line"; **page 5, paragraph 92, lines 1 – 5],**

wherein the input data is color data obtained from measurement of a color chart of an image [Fig. 1 sample image **109** produced by a color patch generator **108;** see also a sample image shown in **Fig. 4];**

a storage unit that stores the conversion data and history information on the measurement of the color chart ["When the profile generation module 1003 runs on a standalone PC, the project DB and colorimetric value DB can be implemented as general data files"; **page 11, paragraph 222, lines 1 – 3.** "The present invention can be applied to a system ... or to an apparatus comprising a single device (e.g., copy machine, facsimile)"; **page 11, paragraph 222, lines 4 - 7];**

an arithmetic unit that compares the history information with information on the measurement of the color chart to determine number of color patches [History information comprises of measured color patch colorimetric values taken at various "timings". If history information does not exist, the

colorimetric values are taken from the original profile. KUMADA explains, "Colorimetric values Lab of color patches output at different timings and their history information are read, and the colorimetric values and standard colorimetric values Lab_i are compared ... If no standard colorimetric values Lab_i are available, colorimetric values used upon generating a profile are used in place of them"; **page 9, paragraph 165, lines 1 – 7.**

By comparing the measured colorimetric value for a color with its standard colorimetric value, a determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the entire color space, a partial color space, or a custom color. "In the example of the color difference for variation display shown in Fig. 35, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36; page 9, paragraph 178, lines 5 - 10];**

and an updating unit that updates the printer profile based on the

number of color patches ["When the color difference has exceeded the allowable level dEi, a profile is regenerated"; **page 9, paragraph 174, lines 1 - 2].**

Regarding claim 2, KUMADA further teaches the image processing apparatus according to claim 1, wherein

the information on the measurement of the color chart includes the color data [Information comprises of measured color patch colorimetric values taken at various "timings". If history information does not exist, the colorimetric values are taken from the original profile. KUMADA explains, "Colorimetric values Lab of color patches output at different timings and their history information are read, and the colorimetric values and standard colorimetric values Lab_i are compared ... If no standard colorimetric values Lab_i are available, colorimetric values used upon generating a profile are used in place of them"; **page 9, paragraph 165, lines 1 – 7],**

number of times of the measurement [As mentioned, the colorimetric values are measured at different timings and their history information are stored. **Fig. 33** illustrates historical color difference data which is used in determining profile regeneration timing**],**

and color regions at the time of the measurement [The determined number of color patches can be based on a color difference for the entire color space, a partial color space, or a custom color. "In the example of the color difference for variation display shown in Fig. 35, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36; page 9, paragraph 178, lines 5 - 10].**

Regarding claim 4, KUMADA further teaches the image processing apparatus according to claim 1, wherein

the arithmetic unit determines the number of color patches based on an evaluation standard, wherein the evaluation standard includes a *newly measured patch value* and an *average of patch values* previously measured and stored as the history information [As previously noted, the profile regeneration timing determines when the printing of one or more color patches is necessary for updating the printer profile. The regeneration timing can be based on "the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color"; **page 9, paragraph 178, lines 6 – 10].**

Regarding claim 5, KUMADA further teaches the image processing apparatus according to claim 1, wherein

> **the arithmetic unit determines the number of color patches based on an evaluation standard, wherein the evaluation standard includes a *newly measured patch value* and a *patch value measured last time* and stored as the history information [**As previously noted, the profile regeneration timing determines when the printing of one or more color patches is necessary for updating the printer profile. KUMADA teaches that a "profile regeneration term" can be calculated as a function of a "newly measured patch value", parameters dE2 (the color difference that has exceeded the allowable level) and T2 (the term from the profile generation date to the "color chart output date" when the allowable level has been exceeded), and a "patch value measured last time", parameters dE1 (the color difference immediately before the allowable level is exceeded) and T1 (the term from the profile generation date to the "color chart output date" immediately before the allowable level is exceeded); **page 9, paragraphs 167 - 173].**

Regarding claim 8, KUMADA further teaches the image processing apparatus according to claim 4, wherein

> **the evaluation standard is a predetermined value obtained for each *neighborhood of whole color regions* that constitute a profile [**By comparing the measured colorimetric value for a color with its standard colorimetric value, a

determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the *entire color space*, a partial color space, or a custom color. "In the example of the color difference for variation display shown in **Fig. 35**, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36**; **page 9, paragraph 178, lines 5 - 10].**

Regarding claim 10, KUMADA further teaches the image processing apparatus according to claim 4, wherein

the evaluation standard is a predetermined value obtained for each *neighborhood of representative colors* including preset colors that constitute a profile [By comparing the measured colorimetric value for a color with its standard colorimetric value, a determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the entire color space, *a partial color space, or a custom color*. "In the example of the color difference for variation display shown in **Fig. 35**, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36**; **page 9, paragraph 178, lines 5 - 10].**

As for claim 23, KUMADA teaches an image forming apparatus comprising:

a converting unit that performs color conversion of input data ["A colorimeter (spectrophotometer) 1001 and colorimetric module 1002 measure color patches of a sample image ... printed by an output device. The colorimetric result is supplied to a profile generation module 1003 *on-line* or off-line"; **page 5, paragraph 92, lines 1 – 5],**

wherein the input data is color data obtained from measurement of a color chart of an image [Fig. 1 sample image **109** produced by a color patch generator **108;** see also a sample image shown in **Fig. 4];**

a storage unit that stores the conversion data and history information on the measurement of the color chart ["When the profile generation module

1003 runs on a standalone PC, the project DB and colorimetric value DB can be implemented as general data files"; **page 11, paragraph 222, lines 1 – 3.** "The present invention can be applied to a system ... or to an apparatus comprising a single device (e.g., copy machine, facsimile)"; **page 11, paragraph 222, lines 4 - 7];**

an arithmetic unit that compares the history information with information on the measurement of the color chart to determine number of color patches [History information comprises of measured color patch colorimetric values taken at various "timings". If history information does not exist, the colorimetric values are taken from the original profile. KUMADA explains, "Colorimetric values Lab of color patches output at different timings and their history information are read, and the colorimetric values and standard colorimetric values Lab_i are compared ... If no standard colorimetric values Lab_i are available, colorimetric values used upon generating a profile are used in place of them"; **page 9, paragraph 165, lines 1 – 7.**

By comparing the measured colorimetric value for a color with its standard colorimetric value, a determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the entire color space, a partial color space, or a custom color. "In the example of the color difference for variation display shown in Fig. 35, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36; page 9, paragraph 178, lines 5 - 10];**

a profile storage unit that stores a printer profile [The colorimetric value DB collects colorimetric value data; **page 10, paragraph 182, lines 2 – 3.** "Upon generating a new profile, the profile generation module 1003 registers history management information and colorimetric value data in the respective databases"; **page 10, paragraph 183, lines 3 - 6];**

an updating unit that updates the printer profile based on the number of color patches ["When the color difference has exceeded the allowable level dEi, a profile is regenerated"; **page 9, paragraph 174, lines 1 - 2];**

and an image forming unit that forms a visible image on a medium [Fig. 1 printer **107].**

As for claim 24, KUMADA teaches a method of image processing comprising:

performing color conversion of input data ["A colorimeter (spectrophotometer) 1001 and colorimetric module 1002 measure color patches of a sample image ... printed by an output device. The colorimetric result is supplied to a profile generation module 1003 *on-line* or off-line"; **page 5, paragraph 92, lines 1 – 5],**

wherein the input data is color data obtained from measurement of a color chart of an image [Fig. 1 sample image **109** produced by a color patch generator **108;** see also a sample image shown in **Fig. 4];**

storing the conversion data and history information on the measurement of the color chart ["When the profile generation module 1003 runs on a standalone PC, the project DB and colorimetric value DB can be implemented as general data files"; **page 11, paragraph 222, lines 1 – 3.** "The present invention can be applied to a system ... or to an apparatus comprising a single device (e.g., copy machine, facsimile)"; **page 11, paragraph 222, lines 4 - 7];**

comparing the history information with information on the measurement of the color chart to determine number of color patches [History information comprises of measured color patch colorimetric values taken at various "timings". If history information does not exist, the colorimetric values are taken from the

original profile. KUMADA explains, "Colorimetric values Lab of color patches output at different timings and their history information are read, and the colorimetric values and standard colorimetric values Lab_i are compared ... If no standard colorimetric values Lab_i are available, colorimetric values used upon generating a profile are used in place of them"; **page 9, paragraph 165, lines 1 – 7.**

By comparing the measured colorimetric value for a color with its standard colorimetric value, a determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the entire color space, a partial color space, or a custom color. "In the example of the color difference for variation display shown in Fig. 35, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36; page 9, paragraph 178, lines 5 - 10];**

and updating the printer profile based on the number of color patches **[**"When the color difference has exceeded the allowable level dEi, a profile is regenerated"; **page 9, paragraph 174, lines 1 - 2].**

Regarding claim 25, KUMADA further teaches the method according to claim 24, wherein

the number of color patches is determined based on an evaluation standard, wherein the evaluation standard includes a *newly measured patch value* and an *average of patch values* previously measured and stored as the history information [As previously noted, the profile regeneration timing determines when the printing of one or more color patches is necessary for updating the printer profile. The regeneration timing can be based on "the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color"; **page 9, paragraph 178, lines 6 – 10].**

Regarding claim 26, KUMADA further teaches the method according to claim 24, wherein

the number of color patches is determined based on an evaluation standard, wherein the evaluation standard includes a *newly measured patch value* and a *patch value measured last time* and stored as the history

information [As previously noted, the profile regeneration timing determines when the printing of one or more color patches is necessary for updating the printer profile. KUMADA teaches that a "profile regeneration term" can be calculated as a function of a "newly measured patch value", parameters dE2 (the color difference that has exceeded the allowable level) and T2 (the term from the profile generation date to the "color chart output date" when the allowable level has been exceeded), and a "patch value measured last time", parameters dE1 (the color difference immediately before the allowable level is exceeded) and T1 (the term from the profile generation date to the "color chart output date" immediately before the allowable level is exceeded); **page 9, paragraphs 167 - 173].**

Regarding claim 29, KUMADA further teaches the method according to claim 25, wherein

the evaluation standard is a predetermined value obtained for each *neighborhood of whole color regions* that constitute a profile [By comparing the measured colorimetric value for a color with its standard colorimetric value, a determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the *entire color space*, a partial color space, or a custom color. "In the example of the color difference for variation display shown in **Fig. 35**, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36**; **page 9, paragraph 178, lines 5 - 10].**

Regarding claim 31, KUMADA further teaches the method according to claim 25, wherein

the evaluation standard is a predetermined value obtained for each *neighborhood of representative colors* including preset colors that constitute a profile [By comparing the measured colorimetric value for a color with its standard colorimetric value, a determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the entire color space, *a partial color space, or a custom color*. "In the example of the color difference for variation display shown in **Fig. 35**, the average color difference for all the color patches (entire device color space), the

average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36**; **page 9, paragraph 178, lines 5 - 10].**

As for claim 37, KUMADA teaches a computer program **[**"a preferred embodiment ... discloses a computer program ... for an estimating method of estimating a profile regeneration timing of a device"; **page 1, paragraph 11, lines 1 - 5]** that makes a computer to execute:

performing color conversion of input data, wherein the input data is color data obtained from measurement of a color chart of an image ["Color patches of the sample image 109 are measured by a color patch colorimetric unit 110 to obtain Lab colorimetric values of the respective color patches"; **page 3, paragraph 61, lines 1 – 3;** see also "**Fig. 1** color patch colorimetric unit **110** and sample image **109];**

storing the conversion data and history information on the measurement of the color chart ["reading colorimetry histories of a device, which include at least colorimetric values and time stamps of different timings"; **page 1, paragraph 11, lines 6 - 8];**

comparing the history information with information on the measurement of the color chart to determine number of color patches [History information

comprises of measured color patch colorimetric values taken at various "timings". If history information does not exist, the colorimetric values are taken from the original profile. KUMADA explains, "Colorimetric values Lab of color patches output at different timings and their history information are read, and the colorimetric values and standard colorimetric values Lab_i are compared ... If no standard colorimetric values Lab_i are available, colorimetric values used upon generating a profile are used in place of them"; **page 9, paragraph 165, lines 1 – 7.**

By comparing the measured colorimetric value for a color with its standard colorimetric value, a determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the entire color space, a partial color space, or a custom color. "In the example of the color difference for variation display shown in Fig. 35, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36; page 9, paragraph 178, lines 5 - 10];**

and updating the printer profile based on the number of color patches

["When the color difference has exceeded the allowable level dEi, a profile is regenerated"; **page 9, paragraph 174, lines 1 - 2].**

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over **KUMADA [US Patent Application 2002/0145744 A1]** in view of **BALASUBRAMANIAN [US Patent 7,064,860 B1]**.

Regarding claim 3, KUMADA does not specifically teach the image processing apparatus according to claim 1, wherein

the converting unit includes a table for converting multi-dimensional Lab values into one-dimensional vector values.

BALASUBRAMANIAN discloses a method for adjusting the "tone reproduction curve" linearization. BALASUBRAMANIAN teaches a method of fine-tuning a printer by printing test patches, obtaining colorimetric L*a*b* values for each test patch, comparing a target value with the measured patch value, and minimizing the difference between the target value and measured value by constructing a set of one-dimensional "tone reproduction curves" **[see Fig. 2].**

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of KUMADA with those of BALASUBRAMANIAN so that the printer could be fine-tuned by use of one-dimensional "tone reproduction curves", one for each of the printer's colorants.

16. Claims 21, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over **KUMADA [US Patent Application 2002/0145744 A1]** in view of **KULKARNI [US Patent 6,870,636 B2]**.

As for claim 21, KUMADA teaches an image processing system comprising:

a server that updates a printer profile based on color data obtained from measurement of a color chart of an image [Fig. 37 server **1501;** "The project DB that collects information required for generating profiles and the colorimetric value DB that collects colorimetric value data used in generation of profiles are present on a server 1501, and the generated profiles are present on clients 1502 to 1504"; **page 10, paragraph 182];**

and a client that is connected to the server [Fig. 37 clients **1502 - 1504],**

wherein the server includes a converting unit that performs color conversion of the color data to produce conversion data [KUMADA teaches that the server collects colorimetric data from a colorimetric module and that the transfer of data can be made by an "on-line" means. "A colorimeter (spectrophotometer) 1001 and colorimetric module 1002 measure color patches of a sample image ... printed by an output device. The colorimetric result is supplied to a profile generation module 1003 *on-line* or off-line"; **page 5, paragraph 92, lines 1 – 5.** "The colorimetric value DB that collects colorimetric value data used in generation of profiles" is present on a server 1501; **page 10, paragraph 182, lines 2 – 4];**

a storage unit that stores the conversion data and history information on the measurement of the color chart [The colorimetric value DB collects colorimetric value data; **page 10, paragraph 182, lines 2 – 3.** "Upon generating a new profile, the profile generation module 1003 registers history management information and colorimetric value data in the respective databases"; **page 10, paragraph 183, lines 3 - 6];**

an arithmetic unit that compares the history information with information on the measurement of the color chart to determine number of color patches [History information comprises of measured color patch colorimetric values taken at various "timings". If history information does not exist, the colorimetric values are taken from the original profile. KUMADA explains, "Colorimetric values Lab of color patches output at different timings and their history information are read, and the colorimetric values and standard colorimetric values Lab_i are compared ... If no standard colorimetric values Lab_i are available, colorimetric values used upon generating a profile are used in place of them"; **page 9, paragraph 165, lines 1 – 7.**

By comparing the measured colorimetric value for a color with its standard colorimetric value, a determination can be made as to whether a particular color requires recalibration. "When the color difference has exceeded the allowable

level dEi, a profile is regenerated, and Tm can be set as a profile regeneration term"; **page 9, paragraph 174, lines 1 – 3;** see also, **Fig. 33.**

Furthermore, the determined number of color patches can be based on a color difference for the entire color space, a partial color space, or a custom color. "In the example of the color difference for variation display shown in Fig. 35, the average color difference for all the color patches (entire device color space), the average color difference for a partial color space region such as a flesh tone region, and the color difference for a custom color such as a spot color are shown" in **Fig. 36; page 9, paragraph 178, lines 5 - 10];**

and an updating unit that updates the printer profile based on the number of color patches ["When the color difference has exceeded the allowable level dEi, a profile is regenerated"; **page 9, paragraph 174, lines 1 - 2],**

and the client includes a profile storage unit that stores a printer profile created by the server ["The generated profiles are present on clients 1502 to 1504"; **page 10, paragraph 182, lines 4 – 5;** see also **Fig. 37** clients **1502 - 1504];**

However, KUMADA does not specifically teach

a printer driver that converts input color data received from an application into output color data that can be interpreted by an image forming apparatus.

KULKARNI discloses a method for determining color mappings for a color printer that can be incorporated into a printer driver. Like KUMADA, KULKARNI teaches a method of deriving these mappings by scanning color patches. KULKARNI explains, "The look-up table is derived from empirical measurements in device independent coordinates of predetermined device dependent color patches. The empirical measurements are preferably stored in a look-up table, with the look-up table commonly being referred to in the art as the 'forward model'. Accordingly, the look-up table that is derived by the present invention from the forward model look-up table will ... be referred to as the 'reverse model' look-up table"; **col. 1, line 65 – col. 2, line 6.**

KULKARNI further teaches a computer system **[Fig. 2]** consisting of a fixed disk that "typically contains operating system 30, device drivers 31, image files 32, and image processing applications 33"; **col. 3, line 66 – col. 4, line 1.** "It should be noted that device drivers 31 can form part of operating system 30, and that forward model look-up table 34 and reverse model look-up table 36 can be embedded in a printer driver included in device drivers 31"; **col. 4, lines 5 – 8.**

It would have been obvious to one skilled in the art at the time the invention was made to combine the teachings of KULKARNI with those of KUMADA to enable a client computer to print from applications by using a printer driver.

Regarding claim 22, KUMADA further teaches the image processing system according to claim 21, further

> **comprising a measuring unit that measures the color chart to obtain Lab values [Fig. 11** colorimeter **1001],**
>
> **and outputs the Lab values to the client [**"When the user wants to know profile generation parameters, or ... wants to regenerate a profile by finely adjusting the profile generation parameters, the profile generation module 1003 acquires colorimetric value data from the colorimetric value DB"; **page 10, paragraph 198, lines 1 - 5].**

Allowable Subject Matter

17. Claims 6, 7, 9, 11 – 20, 27, 28, 30, 32 – 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- U.S. Patent 6,337,922
- U.S. Patent 6,950,197
- U.S. Patent Application, 2002/0039106
- U.S. Patent 6,233,061
- U.S. Patent 6,178,007
- U.S. Patent 5,739,927

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter L. Cheng whose telephone number is 571-270-3007. The examiner can normally be reached on MONDAY - FRIDAY, 8:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

plc

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